REMARKS – General

Claim Rejections – 35 USC §112

The most recent Office Action (OA) rejects claim 1 under 35 USC §112. Specifically, the OA states that the limitation "the lithium ion cell" lacks an antecedent. Applicants have amended the claim to replace "the lithium ion cell" with -- the at least one electro-chemical cell —, which refers to limitation (a) of claim 1. Support for the amendment is found in claim 1. As the amended language has an antecedent in limitation (a), Applicants submit that the §112 rejection is overcome. Applicants respectfully request reconsideration of the rejection in light of the amendment.

Claim Rejections – 35 USC §102

The OA rejects claims 1-8 under §102(e) as being anticipated by Hallaj et al. (US Pat. No. 6,468,689 B1). Specifically, the OA submits that Hallaj et al. teaches a battery pack with a phase change material (having a melting temperature of between 30 and 60 degrees Centigrade and a high latent heat per unit mass ratio and narrow melting temperature range) disposed between the cells. The OA submits that Hallaj et al. does not specifically disclose that the phase change material acts as an insulator at a low temperature and a conductor at a high temperature. The OA states that in the position of the Examiner, those properties are inherent in the phase change material taught by Hellaj et al. Applicants respectfully traverse this position.

Applicants note that Hallaj et al. teaches that the material must have a "...high latent heat per unit mass ration and narrow melting temperature range...", the material must be "...thermally cyclable...", and that the preferred phase change materials are "...paraffin waxes...which have a relatively low melting temperature within the recommended range of operation for Li-Ion cells." Col. 4, lines 18-32. Applicants respectfully submit that the physics of such a material are markedly different from that recited in Applicants' invention. Further, Applicants submit that the waxes of Hallaj et al. do not act as an insulator at low temperatures and a conductor at high temperatures.

Applicants' invention recites as a preferred sleeve material Coolphase MPC-120. Page 3, line 12. Applicants have included with this amendment a datasheet for the

Coolphase material with an appropriate information disclosure statement. Applicants respectfully submit that paraffin wax is markedly different in operation when compared to a material like Coolphase. To begin, Parrafin wax *absorbs* heat when changing from a solid to a liquid. This heat is held in the wax while the wax is in a liquid form, and is then released when the wax returns to a solid. Hallaj et al. discuss this property at col. 3, line 65 through col. 4, line 5 by stating that the "...phase change material 34 can desirably serve or act as a heat sink to absorb excess heat generated within the module...at least temporarily in the phase change material as latent heat." This heat is then released when the wax cools, thereby providing the thermal cyclability recited by Hellaj et al.

Applicants respectfully submit that Coolphase, a thermoplastic, acts quite differently. Coolphase comes in solid sheets that can be wrapped about cells. When the cells heat, the Coolphase material does not turn to a liquid state. Rather, it changes from a rigid solid to a flexible solid, thereby filling any crevices, indentions, imperfections, etc. in the surface of the cell and acting as a *thermal conductor*, not a material of *thermal storage of latent heat*. See data sheet at Description, second paragraph, 5th sentence. In short, paraffin wax is a thermal storage material, whereas Coolphase is a thermal conductor.

To further explain how Coolphase operates as an insulator at low temperatures and a conductor at high temperatures, envision an enlarged cross section of the outer surface of a cell. Tiny imperfections and irregularities along the side of the cell prevent the side from being a smooth surface. When a flat sheet of Coolphase is wrapped about this irregular surface, air pockets exist between the battery and the Coolphase. These air pockets facilitate the insulating function of the material at low temperatures.

When the cell gets hot, however, the Coolphase softens and reflows, so as to fill all the irregularities across the cell. In so doing the thermal conductivity of the Coolphase makes full contact with the cell and transfers heat from the cell, through the Coolphase, to the surrounding environment. Note that once this has occurred, the Coolphase does not return to a flat sheet. Applicants note that the Coolphase must be replaced at page 3, lines 15-16.

A second difference is that the invention of Hallaj et al. must be housed in a sealed container. Without a sealed container, the paraffin wax would leak away from the

cells. The material of Applicants' invention, by contrast, may simply be wrapped about the cells without an external container. As the Coolphase does not change to a liquid state, no leakage results.

A third difference between Applicants' invention and that of Hellaj et al., especially with respect to claim 7, is that Applicants' sleeve is replaceable, whereas the wax of Hellaj et al. is not. To further point out this distinction, Applicants have amended claim 7 to recite a — replaceable sleeve —. Support for the amendment is found at page 3, lines 15-16. Applicants respectfully submit that to replace the paraffin wax of Hellaj et al., one would need to break open the housing, thereby compromising the reliability of the battery pack. By contrast, one replaces the material of Applicants' invention simply by removing the spent sheet and attaching an unused sheet.

For the above reasons, Applicants respectfully submit that the properties of Applicants' claim 1 are not inherent in the paraffin waxes taught by Hallaj et al. Applicants respectfully request reconsideration in light of these comments.

Applicants have amended claim 2 to further recite a preferred material to comprise the sleeve recited in claim 1. Specifically, Applicants have amended the claim to recite the use of an aluminum filled thermally conductive phase change material. Support for this amendment is found at page 3, line 12, in that one preferred material, Coolphase MPC-120, comprises an aluminum filled thermally conductive phase change material. Applicants submit that Hallaj et al. teaches the use of paraffin wax, not an aluminum filled thermally conductive phase change material.

Applicants have amended claim 4 to provide a consistent antecedent basis in reference to claim 1. Support for the amendment is found in claim 1 as originally filed.

The OA rejects claims 7-8 under §102(e) as being anticipated by Sayler et al. (US Pat. No. 6,192,703 B1). Specifically, the OA submits that Sayler et al. teaches a container useful for transporting a themperature sensitive material to various remote areas. The container utilizes phase change materials for thermal stability. The OA submits that it is the position of the Examiner that those properties of Applicants' claim 7 are inherent in

the phase change material taught by Sayler et al. Applicants respectfully traverse this rejection.

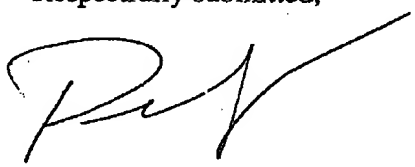
To begin, Applicants respectfully submit that the phase change material of Saylor et al. is not replaceable as is recited in Applicants' amended claim 7. Next, Applicants respectfully submit that for a novelty rejection under §102(e), all of Applicants' claimed limitations must be found in the reference. Applicants respectfully submit that Saylor et al. does not teach a sleeve shaped so as to define a cavity that is complementary in shape to a battery. Saylor et al. fails to teach any batteries at all other than an external battery used to power a swing motor vapor compression unit. This battery is disposed exterior to the phase change compartment.

Thus, Applicants respectfully request reconsideration of the §102 rejection in light of the amendment and the comments above.

CONCLUSION

For the above reasons, Applicants believe the specification and claims are now in proper form, and that the claims all define patentably over the prior art. Applicants believe this application is now in condition for allowance, for which they respectfully submit.

Respectfully submitted,



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